

Mapping Census 2000: The Geography of U.S. Diversity

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By
Cynthia A. Brewer and
Trudy A. Suchan

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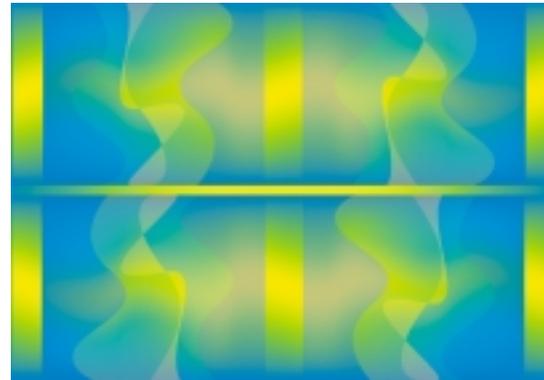
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About This Report

Mapping Census 2000: The Geography of U.S. Diversity (Census Special Reports, Series CENSR/01-1) presents a synthesis of the basic patterns and changes in U.S. population distribution in the last decade. Each page features county-level detail for the 50 states, the District of Columbia, and Puerto Rico. Each page also includes a small state-level map for a simplified view of the population theme. The Census 2000 data in this report are based on the U.S. Census Bureau Redistricting (PL 94-171) Summary File. These data were released in March 2001 and were sent to each state for use in redrawing federal, state, and local legislative districts. Use of this source limits the report themes to total population, race and ethnicity, and population under age 18 (derived from the voting-age population counts in the redistricting data). Although potential topics were limited by this source, *Mapping Census 2000* provides a news-filled first look at diversity and change in the population. The report presents pairs of maps on facing pages, often showing a 2000 population distribution map and a corresponding 1990 to 2000 change in population. The report begins with general sections on the total population and overall diversity and then systematically maps data for race and Hispanic or Latino groups.

Race and Ethnicity

Starting with Census 2000, the U.S. Office of Management and Budget (OMB) requires federal agencies to use a minimum of five race categories: White; Black or African American; American Indian and Alaska Native; Asian; and Native Hawaiian and Other Pacific Islander. For the Census 2000 questionnaire, OMB approved including a sixth category, “Some other race.” Thus, *Mapping Census 2000* uses six race categories. People who marked only one race on their census form are counted in “One race” groups. A series of “One race” maps is provided for each race group. Those who marked exactly one race combined with those who marked that race and at least one other race are mapped in the “One or more races” series for each race group. Individuals who chose more than one of the six race categories are referred to as the “Two or more races” population. This group is included on maps in the Diversity section and as a race group in *Mapping Census 2000*.

This report maps four topics — “Percent Change,” “Percent of Population,” “Percent Under Age 18,” and “Number of People” — for each race in two ways. These maps are shown for people indicating exactly one race and again for people indicating one or more races. For each race group, a fifth map topic illustrates the proportion of people who marked exactly one race compared with all people who marked that race, either alone or with other races. For more detail on the Census 2000 race and ethnicity categories, refer to the Census Bureau report *Overview of Race and Hispanic Origin* (Census 2000 Brief, Series C2KBR/01-1). In other Census 2000 data products, the “One race” and “One or more races” groups may be listed respectively as “alone” and “alone or in combination” population variables.

In the race sections of the report, the 1990 to 2000 change maps compare 1990 data to 2000 “One race” and “One or more races” groups. Neither choice is directly comparable to the 1990 data, but together they offer contrasting understandings of changes in the U.S. population. There is no 1990 census group suitable for comparison with the 2000 “Two or more races” group because that information was not collected in the 1990 census.

An additional change in race reporting for Census 2000 was separation of the 1990 “Asian and Pacific Islander” category into two groups: “Asian” and “Native Hawaiian and Other Pacific Islander.” For change maps in this report, detailed 1990 data were reaggregated to create separate “Asian” and “Native Hawaiian and Other Pacific Islander” groups for comparison with Census 2000 race categories.

Race and ethnicity data are not available from the 1990 census for Puerto Rico because the questions on race and Hispanic origin were not included on the 1990 census form used in Puerto Rico. Because of the difference in 1990 forms, some 1990 to 2000 change maps in this report show “no data” for Puerto Rico. In 2000, the same questions on race and Hispanic origin were asked of people in the 50 states, the District of Columbia, and Puerto Rico, so all maps of 2000 data include Puerto Rico.

The Census Bureau used two ethnicity categories in both 1990 and 2000: “Hispanic or Latino” and “Not Hispanic or Latino.” (The terms “Hispanic or Latino origin,” “Hispanic or Latino,” and “Hispanic” are used

interchangeably.) Race and ethnicity are considered two separate concepts, and therefore Hispanics may be of any race or races. The Diversity section of this report includes both race and ethnicity categories together on maps of “Prevalence” and “Diversity” using the following categories:

- Hispanic or Latino;
- White, not Hispanic or Latino;
- Black or African American (“Black or African American” and “Black” are used interchangeably);
- American Indian and Alaska Native (AIAN);
- Asian;
- Native Hawaiian and Other Pacific Islander (NHOPI);
- Some other race, not Hispanic or Latino; and
- Two or more races, not Hispanic or Latino.

White, Black, AIAN, Asian, NHOPI and “Some other race” categories include people who indicated exactly one race. All people who indicated more than one race are grouped together in the “Two or more races” category.

For the prevalence maps, people who indicated Hispanic or Latino and also indicated Black, AIAN, Asian, or NHOPI are counted in both the Hispanic or Latino group and in their respective race group. One-half of one percent of the total U.S. population (approximately 1.3 million people) is represented twice in the percentages compared on these maps. There is no additional overlap among these categories. The eight map categories on the prevalence maps sum to 100.5 percent of the U.S. population.

Unlike the percentage comparisons for the prevalence maps, the diversity index calculation is compromised when percentages do not add precisely

to 100. Therefore, people who are both Hispanic and Black, AIAN, Asian, or NHOPI are included only in their respective race group for the diversity map calculations. There are a variety of ways ethnicity may be incorporated with race groups in the calculation of diversity measures. In this report, the calculations for the diversity maps use categories generally consistent with the prevalence maps with the goal of producing a coherent report section. The diversity index mapped is termed Simpson's Index in biology literature.

Maps

Most of the maps in the report are choropleth maps. They use colors filling counties or states to represent mapped data values. The map legends (on the right side of each page) list the range of data values that each color represents. These data ranges are termed “classes.” Choropleth maps are well suited to showing derived values such as percent or density. They are less appropriate for representing total numbers of people. They are, however, used for totals in the atlas for county identification and county-to-county comparisons with other mapped data. As an alternative to choropleth mapping, the distribution map with symbols proportioned to total number of people is included to give a better sense of the overall distribution of population.

Some of the maps have an overlay that masks counties with very small populations for the group mapped. For example, the percent change in people of Hispanic or Latino origin is not shown in counties where there are fewer than 100 Hispanics. Small populations are masked because they often produce extreme percent changes, which distract from understanding the more reliable pattern over areas with greater numbers of people. Masks for populations less than 100 are also used for maps of percent under age 18.

Cartographers employ many strategies for deciding class breaks for choropleth maps. Some of the basic approaches are to customize breaks using characteristics of the data values shown on the map, to use arbitrary round numbers, and to use breaks that arise from knowledge about the map topic. An additional criterion is whether comparison between maps is more important than optimizing classes for individual maps. In the report, comparison between maps is emphasized by use of the same categories among maps in a series. The class breaks on the maps were chosen using a combination of arbitrary rounded breaks shared between maps and national rates for each topic.

The maps are designed both to aid map comparison and provide critical summary breaks within maps. For example, the maps of percent of total population in individual race groups use some meaningful percentage breaks, such as 50 percent of the population, and they use the U.S. percent for the group mapped. They also share breaks at or near many of the U.S. percents for other groups. For U.S. percents that are similar for more than one group, a rounded summary number is used on most maps (for example, 1.0 percent). This number is then replaced with the exact U.S. percent when the group is mapped. For example, 1.5 and 0.9 percent replace the 1.0 percent break for American Indian and Alaska Native maps.

As mentioned, many maps use an overall U.S. national percent or density as a class break. The U.S. percent for a group is calculated using populations for the United States as a whole (for example, the total population under age 18 divided by the total U.S. population). Note that these summary numbers are not averages of state or county percents. The calculations of the U.S. summary numbers are based on data from all states and the District of Columbia but do not include Puerto Rico.

All data were rounded to one decimal before they were mapped. The minimum and maximum data values for a topic are used as the lowest and highest values reported in map legends. Large maximums for “Number of People” maps are rounded to the next highest number with four significant digits. Similarly, when only one state (or the District of Columbia or Puerto Rico) is represented by a color on a state-level map, the data value and the state abbreviation are reported in the legend rather than a data range (for example, “25.1 (DC)”).

Color Use

The maps present eight different color schemes. Use of a shared color scheme across a series of maps signals that they represent similar data. On many maps, colors are arranged from light for low data values to dark for high values. Dark purples, blues, and greens are used for the high values on maps. On the difference, age, and change maps, values diverge in two directions from a summary midrange value. Both ends of the data range are emphasized with dark colors of two different hues. Light colors are used on these maps around the midrange values to emphasize difference from a U.S. summary rate or zero change. For consistency with other color schemes, dark purple, blue, and green hues are maintained for the high values on maps with diverging color schemes. Low or negative values are shown in pinks, oranges, and browns. A particular color generally has the same meaning within a series so that maps are easily compared. Ranges for colors change when breaks are adjusted to include U.S. overall rates specific to the group mapped. For example, a light pink is used to signal ranges between zero change and the overall U.S. change for the group mapped, a range that is different for each change map. In addition, colors were selected to accommodate readers who are color blind.

Three different hues in the title bar along the top of map pages are used to group maps into sets across atlas sections: maps that involve the total U.S. population (orange bar), maps that focus on people who indicated only one race on their census form (yellow), and maps that include people who indicated more than one race (pink).

Other Notes

Most map titles list map theme, year(s), and demographic group(s). Legend captions, though sometimes lengthy, provide a more detailed explanation of the map topic. A map reader will usually begin by reading the title of the map for the general topic and then read the legend caption for explicit details of the data calculation presented on the map. The specific ranges represented by each map color are the third level of detail that a map reader will examine. Interpretive text was not included in the atlas in order to go to press as soon after the release of the redistricting data as was feasible. The authors hope the design fosters interpretation of the information by analysts in government agencies, academics, journalists, and people at home.

Maps necessarily show generalized information to emphasize patterns. For the reader interested in exact data values for the themes mapped, detailed tables can be found on the Web, www.census.gov/main/www/cen2000.html. In addition, American FactFinder on the Web at factfinder.census.gov provides census data and mapping tools.

To permit change mapping, previously published 1990 census data were reagggregated to Census 2000 geography. This update affected only five counties or equivalent entities in the country (Denali and Yakutat Boroughs, Alaska; Halifax County, Virginia; and Gallatin and Park Counties, Montana).

During atlas planning, the authors examined a wide range of atlases that included population themes. Some were specific to particular types of data, and some were country or state atlases. Examples of previous atlases that include innovative approaches to topics or are good examples of standard data presentations are listed in the bibliography that concludes this section.

The maps in *Mapping Census 2000* were created in ArcInfo 8 (prerelease v. 8.1) geographic information and mapping software from ESRI in Redlands, California. Each of the five mapped areas on each page was drawn using a customized version of the Albers Equal Area conic map projection.

Copies of this report are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. General questions about the report may be addressed to Dr. Trudy A. Suchan, Population Division, U.S. Census Bureau, Washington, DC 20233 or to the e-mail address <pop@census.gov>.

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